Very many inquiries were made at the various stopping-places in the north of Norway concerning the chances of fine weather in the neighbourhood of Vadsö. The English Consul at Hammerfest, where H.M. *Volage* picked up Mr. Fowler and Dr. W. Lockyer, informed them that the question of clear or foggy weather depended almost entirely on the direction of the wind. An east wind at Vadsö meant foggy weather, a west wind fine; the reverse was the case at Hammerfest. It was also mentioned that the south side of the Varanger Fjord seemed to be more free from fogs than the northern shore. The news seemed very encouraging, since it was proposed from the beginning to settle on the southern side. It was also made manifest that it would be unwise to select an elevated spot, since clouds and mists often were seen hanging about at 100 feet and over, while the lower levels remained clear. The experience, gathered from the first few days spent on the southern shore, did not, however, bear out very exactly the Hammerfest information. The 24th and 25th were both miserably wet days, and yet the wind was blowing hard the whole time from the north-west. The following two days were very fine and hot, the wind coming from the eastward. But the view as to the necessity of a low elevation has been quite justified by what has taken place here.

When mists were prevalent, Kiö has always been better off than the surrounding country. The hills to the south-east and south-west have often been wrapped in mists, while the eastern horizon at the camp has been as clear as a bell. So far we have only experienced one fog.

The weather so far has seemed to have a two-day period, two fine days following wet days. The 29th and 30th were wet and windy days, while the two following ones were moderately fine. On the s.s. *Garonne* I had an opportunity of consulting two pilots well acquainted with the Veranger fjord, and both informed me that the characteristic feature of the weather was that the mornings were fine and the sky was overcast later. This has so far in the main proved accurate. The eastward horizon (we have a sea horizon) has been nearly always clear in the earlier part of the morning, *i.e.* about six a.m., while towards six p.m. it was invariably cloudy. This gives us good encouragement, and make our chances of fine weather at the time of the eclipse very hopeful. And it may be stated, further, that the chances are that even if the eclipse morning proves misty, our place of observation will be the best available, and only clouds will prevent a successful issue.

J. NORMAN LOCKYER.

(*To be continued.*)

## NOTES.

SIR GEORGE BADEN-POWELL did science a very important service when he conveyed a small party of observers to Novaya Zemlya to record the characteristics of the eclipse of August 9. Mr. Norman Lockyer points out in the *Times* that, thanks to this timely aid, the failures in Norway and Japan are much less disastrous than they otherwise would have been. He has received a code telegram from Mr. Shackleton, one of his assistants who accompanied Sir G. Baden-Powell, stating that results just short of the best possible have been obtained. The programme of work arranged for Novaya Zemlya included a series of twenty-two photographs with the prismatic camera (that is, a long photographic camera with two large prisms of 60° in front of the lens). The exposures were to begin thirty seconds before totality, and were to end shortly after it. They varied from snap-shots to forty seconds. The times of exposures were arranged to secure specially the spectrum of the corona. Besides this work, to which the highest value is attached, three photographs of the corona were to be obtained with a long focus telescope of 4-inch aperture. It is a matter of congratulation that these instruments have been utilised, and as Dr. Stone, who also accompanied the party, was probably equally successful in making observations, we may say that the eclipse has been saved from entire failure, so far as British astronomers are concerned, by Sir G. Baden-Powell's assistance. As to Russian observers, a Reuter telegram from St. Petersburg, August 20, says:—"The Russian astronomical expedition, which was sent to the north of Finland to observe the solar eclipse, telegraphs from Tornea that, owing to the magnificent weather which prevailed at the time, ten good photographs of the corona were obtained by means of three different apparatus. The Hydrographical Department has received a telegram from General Baron Maidelicheff, of the Saghalien astronomical expedition. The message, which was despatched from Cape Notoro, the south-western extremity of Saghalien, states that the observation of the eclipse was fairly successful, and that, although the sky was cloudy, two photographs of the corona were obtained. Some magnetic variations were noticed during the eclipse."

AT the moment of going to press, the following details have been received from Mr. Shackleton, with reference to his observations at Novaya Zemlya:—"I obtained about eight photos during totality. The most successful are those at the beginning of the eclipse, also at the end and the long exposure near mid-totality. The two photos near the beginning of totality are very interesting: the one nearest the time of the beginning of totality shows, I think without doubt, as many bright lines as there are in the Fraunhofer spectrum with the same instrument, so in all probability we have succeeded in photographing the 'reversing layer.' The plate at the end of totality also shows a great many lines, but not as many as at the beginning; probably they are the same as those photographed by Mr. Fowler in the metallic prominences of 1893—certainly most of them are. The long exposure near mid-totality gives a good ring at 1474 K, and also one near K (3969 λ), and several other fainter ones. The spectra are not so extensive in ultra-violet lines as those of 1893, probably because of the cloudy state of the sky. The corona-photos have also come out very well." We propose to refer more fully to the Novaya Zemlya observations in an article in our next issue.

THE Royal Society was represented at the funeral of Sir John Millais, on Thursday last, by Dr. Michael Foster and Sir Joseph Fayrer. Among other scientific bodies, which honoured art in the person of the late President, were the Society of Antiquaries, the Royal Astronomical Society, the Linnean, Chemical, and Geological Societies, the British Museum, the Royal Geographical Society, the Institution of Civil Engineers, the Colleges of Physicians and Surgeons, and the Royal Institution of British Architects.

THE success of Sir Martin Conway's expedition to Spitzbergen was noted in our issue of August 6. A Reuter's telegram from Tromsö, dated August 21, states that the whole party had arrived there on their way home. Mr. Garwood and Mr. Trevor-Battye had left the main party in Spitzbergen in order to explore Horn Sund, and they succeeded in reaching and ascending Hornsund Tind, a "marble mountain" in the middle of Southern Spitzbergen, which has hitherto only been seen from the sea. They studied the geology and glacier systems of the surrounding country, and encountered serious difficulties on account of the boisterous weather. By no means the least daring part of their journey was the return from Spitzbergen to Norway in a small steam launch of less than twelve tons, necessarily a much less seaworthy craft than a sailing boat of the same size.

A REUTER telegram states that the Danish cruiser *Ingolf* returned to Copenhagen on Thursday last from a long voyage, under the leadership of Commodore Wandel, undertaken for the purpose of exploring the navigable waters round Iceland. The expedition, which lasted two years, was highly successful. In the southern part of Davis Strait the explorers discovered a submarine mountain range. The scientific results, especially from a hydrographical and zoological point of view, are said to be exceedingly valuable.

We regret to announce that Prof. A. H. Green, F.R.S., Professor of Geology in the University of Oxford, died on Wednesday, August 19, at the age of sixty-four. We also notice with regret the death of Dr. Rüdinger, Professor of Anatomy at Munich Observatory; Mr. Frederick Brodie, whose name will be remembered by many astronomers in connection with drawings of Donati's comet of 1858; and Miss G. E. Ormerod, the sister of the well-known entomologist. Miss Ormerod took an active share in her sister's useful work.

Harvard University, and geology, have lost a distinguished worker by the death of Prof. Josiah Dwight Whitney. From a notice in the *Times*, we gather that Prof. Whitney was born at Northampton, Massachusetts, on November 23, 1819. He graduated at Yale in 1839, and in the following year he joined the survey of New Hampshire as assistant geologist under Mr. C. T. Jackson. Two years later he went to Europe, and pursued his studies in chemistry, geology, and mineralogy. On his return to America in 1847 he investigated the geology of the Lake Superior region, being appointed with Mr. J. W. Foster to assist in making a geological survey of the district. In 1855 he was appointed State chemist and professor in the Iowa University, and was associated with Mr. James Hall in the geological survey of that State, of which he published an account. From 1858 to 1860 Prof. Whitney was engaged on a geological survey of the lead region of the Upper Missouri in connection with the official surveys of Wisconsin and Illinois. He was appointed State geologist of California in 1860, and conducted a topographical, geological, and natural history survey of that State till 1874, when the State Legislature discontinued the work. Besides numerous pamphlets and annual reports, Prof. Whitney issued "Geological Survey of California" (six vols., Cambridge, 1864–70). In 1865 he was appointed Professor of Geology at Harvard University, and retained the chair till his death. The honorary degree of LL.D. was conferred on him by Yale in 1870. Prof. Whitney was one of the original members of the National Academy of Sciences named by Act of Congress in 1863, but he subsequently withdrew from that body. He was a member of a large number of scientific bodies, both at home and abroad. He translated Berzelius's "Use of the Blowpipe" (Boston, 1845), and he wrote a guide-book to the Yosemite (San Francisco, 1869). It is a significant testimony to his scientific eminence that Mount Whitney, the highest mountain in the United States, is named after him.

An International Exhibition of Gardening will be opened at Hamburg at the beginning of May next, and close at the end of September. The Exhibition is intended to comprise all branches of gardening and the cultivation of all kinds of plants.

The fourth International Congress of Criminal Anthropology was opened at Geneva on Monday, and is to last till Saturday. Great Britain is officially represented, and Mr. Francis Galton, F.R.S., is among those who are down to read papers at the Congress.

The Paris correspondent of the *Chemist and Druggist* states that the crypt made under the principal entrance of the Rue Dutot Institute, which is to contain Pasteur's tomb, is rapidly approaching completion. At the entrance of the vault is the following inscription in French:—"Happy is he who carries within himself a God, an ideal of Beauty, and obeys it; an ideal of Science, an ideal of the virtues of the Gospel." In the interior the arches are decorated with groups of animals, surrounded by frameworks of vines, mulberries and hops. Symbolical winged figures, representing Faith, Hope, Charity, and Science, appear in the centre of the cupola, forming a highly artistic group, and one which is identified with the illustrious savant's character. It is probable that the remains of the great chemist will be transferred to the Institute from Notre Dame on December 27, the anniversary of his birth.

The International Exhibition to be held in Brussels next year promises to be of a very important character. Though commenced as a private enterprise, it is now a national undertaking, assisted by the State, and having as its patron King Leopold, while the Count of Flanders has accepted the honorary presidency. The French Government has made a grant of £35,000; Germany has so far voted no money, but has formed a powerful commission, under the presidency of Prince Charles of Hohenzollern; the United States has made a grant; the South American Republics will, in nearly all cases, be represented, and it is expected that there will be Italian, Russian, Austrian, and Scandinavian Courts. As for this country, the Government is taking an interest in the success of the undertaking, and at its request a British Commission has been formed under the presidency of Sir Albert Rollit, and with Mr. James Dredge, one of the editors of *Engineering*, as executive commissioner. It is hoped that British science, art, and industry will be worthily represented at the Exhibition.

With reference to the period of extremely hot weather in the United States, a correspondent writes:—"The hot weather began on August 4, and for eight days succeeding was felt over the greater part of the United States. The deaths on Tuesday, August 11, both in New York and in Brooklyn, surpassed all previous records, but were again exceeded on the following day. In the twenty-four hours ended at noon, August 13, 374 death certificates were filed at the Bureau of Vital Statistics in New York City. Of these the cause of death given in 158 cases was sunstroke. The total number of fatal sunstrokes in eight days was 617. Coroners and undertakers have been unable to dispose of the dead with sufficient speed to protect the health of the living. Lower animals, horses, dogs and cats, have died by thousands. Over one thousand horses perished in New York City, and facilities for removing the bodies were so inadequate that many remained for days where they fell. Some of the busy thoroughfares of the city were strewn with dead horses like a field of battle. In one instance, eighteen were said to be lying in one street within a short distance of each other. Brooklyn fared somewhat better on account of its proximity to the ocean; but Chicago was stricken almost like New York City. In many smaller cities similar effects were produced, and it will be impossible ever to make an accurate statement of the total fatality. In the Central Western States, the temperature rose to 110° and 115° in structures exposed to the sun at many points, and even 125° was reported from portions of Illinois, not, of course, in shaded observation stations, but in inhabited buildings."

The seventh annual meeting of the Museums Association, held at the latter part of July in Glasgow, was a most successful one from every point of view, and in some of its importan features it exceeded any of the previous conferences. The whole of the arrangements for the meeting were carried out by the Corporation of Glasgow, who gave a very cordial welcome to the Association, and offered them every facility for inspecting the museum schemes, some developed and others developing, which mark Glasgow out as probably one of the most advanced in the kingdom in its recognition of the important value of museums and art galleries to the people of a great community. In Kelvingrove Park the Corporation are erecting a science and art museum of palatial dimensions at a cost of over a quarter of a million, and while thus recognising the need of a central building, adequate to the exposition of science and art in its broadest sense, they have endeavoured to meet the natural requirements of an extensive city by establishing subsidiary museums in various parks and open spaces, the latest of these being the Camphill Gallery in Queen's Park, devoted at present to special exhibitions. In his presidential address Mr. James Paton, Curator of the Galleries and Museums, gave an interesting account of their foundation and progress. The papers read at the meeting included such practical subjects as descriptive labels for geological collections, by H. Bolton. electrotypes in Natural History Museums, by F. A. Bather; Type specimens in Botanical Museums, by E. M. Holmes; Chemistry in Museums, by George W. Ord; illustrated lectures in Museums, by Thomas Rennie; the lighting of Museums, by Thomas White; and a paper by F. A. Bather, on how may Museums best retard the advance of science, in which in a satirical vein he pointed out how the storage or even exhibition of specimens is not necessarily conducive to the elucidation of their history and structure. In addition to the various Glasgow museums, the members of the Association paid a visit to Perth, on the invitation of the Lord Provost, and they there had the opportunity of inspecting, under the able guidance of Mr. Henry Coates and Mr. Alexander M. Rodger, one of the most recent, as it is the most interesting and attractive, museums of a purely local character that has ever been formed in Britain.

THE interest of Prof. Ewart's experimental stud at Penicuik, Midlothian, was increased, a few days ago, by the arrival of a hybrid between a male Burchell's zebra (*Equus burchelli*) and a mare (*Equus cabattus*). Though the mare is jet black, the foal, except over the hind-quarters, has as many bands as its zebra parent. The bands are fawn-coloured, the background nearly black. But though the hybrid by its stripes suggests the zebra, in form it closely resembles an extremely well-bred foal. Should the mare have a foal to Prof. Ewart's Arab horse "Benazrek," provided with stripes and other zebra-like features, an important step will have been made in justifying breeders in believing in Telegony, or, as it is familiarly called, "the infection of the germ." When the present hybrid colt and the hybrids expected next summer reach maturity, it will be alike interesting and important to ascertain whether they are fertile with each other, and with pure horses, zebras, and asses.

IN a very interesting paper on the geology of Novaya Zemlya (*Izvestia* of the Russian Geographical Society, 1896, i.), Prof. Chernysheff points out the difference which exists between the middle parts of the island and its southern part. The latter, which must be considered as a continuation of the Pai-kho, or northern Ural ridge, is a plateau consisting of Lower Permian deposits (Artinsk layers) stretching north-west; while in the north of Bezymyannaya Bay (72° 40′) the island consists of an Alpine region, rising to an altitude of 4000 feet, and is built up of Devonian rocks, stretching north-east, and intersected by deep transversal valleys of aqueous origin, such as Matochkin Shar, and several others. It may be added to this fundamental fact, fully established by M. Chernysheff, that we should thus find in Novaya Zemlya a repetition of what is seen further south in the Urals, which also consist of plateaus stretching north-west, and of chains of mountains having a north-eastern direction. The whole of the island has been extensively glaciated. Immense moraines have been accumulated at levels which are much higher than those on which we now find *firn*-fields in the south, and in the north big moraines are found, where there are no glaciers at the present time, or only very small ones. The glaciation of Novaya Zemlya was contemporaneous with the glaciation of North Russia, and was followed by a period of subsidence, during which an archipelago of small islands was all that remained of the big island. Terraces of marine origin, containing shells of molluscs now living in the Arctic Ocean, are admirably well developed along the shores, up to an altitude of 160 metres above the sea-level. At the present time the island is in a period of upheaval, and its glaciers are again on the increase. Large fields of *firn*, in which the ice has the same structure as in glaciers, are spread over the southern plateau; while further north, in the Alpine tracts, young glaciers are being formed; so that if the same conditions continue to prevail, the island will become again the ice wilderness it formerly was.

PROF. A. W. RÜCKER contributes to the July number of *Terrestrial Magnetism* a summary of the results of the recent magnetic survey of Great Britain and Ireland, conducted by Dr. Thorpe and himself. Prof. Rücker presents his valuable summary under three heads. (1) On the accuracy of the delineation of the terrestrial isomagnetic lines. (2) On the accuracy of the determination of the local disturbing magnetic forces. (3) On the relation between the magnetic and the geological constitution of Great Britain and Ireland. Illustrations accompany the article. An investigation of magnetic disturbances during the interval 1890-95, as taken from the records of the Potsdam magnetograph, is described by G. Lüdeling. For this interval the author fails to find a marked relationship between the annual curve of sun-spot frequency and the annual variation of magnetic disturbances. There is, however, a close correspondence in the diurnal and in the annual variation of the disturbances and of polar lights as observed at Oxford.

THE mode by which light and Röntgen rays are able to bring about the discharge of an electrified surface, is discussed by Dr. Oliver Lodge in *Science Progress*. Experiments were carried out by him with the object of testing the presence of metallic particles or vapour near an electrified metal rapidly discharging under the action of light. The results lead to the conclusion "that the discharge of electricity from illuminated surfaces is not effected by evaporation of those surfaces, but that the molecules, which convey the charge, belong to something in the gas, and not to the illuminated body." It is suggested that the discharge of an electrified surface by Röntgen rays—an action which seems to be brought about by the conversion of the gas, or other insulating material, near the charged body into a conductor—is probably effected "by dissociating the substances into charged atoms which are then free to act as carriers, and speedily convey to a distance the charge of an electrified body by journeys along the lines of force. It may be that ultra-violet light acts in somewhat the same way, but not in exactly the same way." As to the nature of the rays, everything now indicates them to be transverse vibrations, and Dr. Lodge thinks their wave-lengths are not much greater than the size of atoms.

PROF. VICENTINI, whose microseismograph has been noticed several times in these columns, has recently erected at Padua an important modification of his instrument. His original microseismograph at Siena consists of a pendulum whose bob remains nearly steady during rapid vibrations, and the movements of the ground are magnified, first by a vertical lever, and still further by two horizontal levers at right angles to one another. In this form, it is most useful for giving the times of the different phases of a disturbance; but, owing to the comparatively small velocity (2 mm. per minute) of the paper on which the movements are recorded, it furnishes but little information as to the direction of the displacements. At the suggestion of Dr. Pacher, the pair of horizontal levers has been replaced by a small and very light pantagraph; the weight of the bob has also been increased from 50 to 100 kg., the length of the pendulum from 1·50 to

3·36 metres, and the velocity of the paper to about 15 mm. per minute. The diagrams are of course distorted in the direction in which the paper moves, and they no longer give the exact times of particular phases; but, acting in concert with the older form, the new microseismograph furnishes valuable data with regard to the character and direction of the pulsations. In the paper by Prof. Vicentini and Dr. Pacher, in which these changes are described (*Atti del R. Ist. Veneto di scienze*, &c., vii., 1896), two interesting diagrams are reproduced, both corresponding to very distant, but unknown, earthquakes—one on December 25, 1895, and the other on January 15, 1896.

WE have received from Dr. Joachim Sperber, of Zurich, a *brochure* of 37 pp. on the parallelogram of forces regarded as the basis of the periodic system in chemistry. After applying the principle to a number of numerical calculations, the author remarks in conclusion, that the stereochemistry of carbon and nitrogen is nothing but a case of resolution into components in different directions. The paper is published by E. Speidel, of Zurich.

AMONG the 300 species, or thereabouts, of plants which Lundström and others describe with more or less accuracy as acarophilous, no gymnosperms or monocotyledons have hitherto been included, but Dr. de Gasparis, in the *Rendiconto della R. Accad. delle Scienze fisiche e matematiche* (Naples), describes a monocotyledon *Scindapsus dilaceratus* as having *Acarus*-galls produced freely at the bases of the leaf-segments. He describes them as being produced undoubtedly as the result of puncture, and details the changes which take place in the mesophyll of the leaf, resulting in a small chamber surrounded by many layers of special cells. Although he apparently accepts Lundström's view that these *Acarus*-galls are a strict case of symbiosis, the plant profiting alike by the secretions of the *Acari*, and by the latter consuming fungus spores, &c., which otherwise might germinate upon the epidermis of the plant, he produces no evidence to show that in this particular case symbiosis exists

WE have received from the agricultural department of the Glasgow and West of Scotland Technical College a *brochure* of seventy pages, embracing reports on experiments on the manuring of oats, hay, and turnips, on finger-and-toe in turnips, and on the spraying of potatoes, conducted in 1895 by Prof. R. P. Wright and others on farms in the south-west and centre of Scotland. The results of the experiments upon the oat-crop indicate that nitrogenous manures, such as nitrate of soda and sulphate of ammonia, applied alone, retard ripening, but give large and profitable, though somewhat irregular, increases of crop; also that these nitrogenous fertilisers are more uniform and more regular in their action when applied with a soluble phosphatic manure, particularly superphosphate of lime. In the case of the fungoid disease finger-and-toe—known also as club-root or anbury—confirmation is afforded of the previously ascertained fact that liming, if done early, will benefit a crop of turnips on land where the disease is prevalent. The spreading out on lea land of diseased roots to be consumed by stock is very properly condemned. It may be mentioned that finger-and-toe is very prevalent this season, especially in Scotland and the North of England, and it is no doubt a source of serious loss; the pathogenic organism is *Plasmodiophora brassicæ*. It is difficult to understand why the spraying of the potato crop with *bouillie bordelaise*, as a check upon the potato disease, should give such indifferent results in Scotland, whilst the practice has been attended by substantial benefit in England and France, and particularly in Ireland. We quite agree that, at present, "it would be rash to draw definite conclusions" from the general results of the experiments that have hitherto been made in Scotland.

MESSRS. G. BELL AND SONS have sent us an advance prospectus of a work they are about to publish under the title "Men and Women of the Century." The work comprises a series of portraits of notable men and women who have sat to Mr. Rudolf Lehmann between the years 1847 and 1895, each portrait signed with the autograph of the sitter. There will be twelve photogravures, from paintings, and about seventy facsimile reproductions of the drawings in half-tone, some of them printed in colours, and all executed by the Swan Electric Engraving Company. Among the scientific men whose biographies and portraits are given are the following:—A. von Humboldt, Louis Pasteur, Sir Richard Owen, Prof. Virchow, Prof. Huxley, Prof. Burdon Sanderson, Prof. Mommsen, Prof. Max Müller, Prof. Du Bois Reymond, Sir William Siemens, von Ranke, Sir David Brewster, Sir Henry Bessemer, and Sir Spencer Wells. The collection will thus form an interesting private gallery of contemporary portraits. It is edited by Mr. H. C. Marillier, who contributes an introduction and the short biographical notices.

THE additions to the Zoological Society's Gardens during the past week include a Capybara (*Hydrochœrus capybara*) from South America, presented by Mr. F. W. Temperley; a —— Fox (*Canis* ——) from Nicaragua, presented by Mr. F. A. Pellas; a Black-necked Grackle (*Gracupica nigricollis*) from China, presented by Dr. Nowell; a Salt-water Terrapin (*Clemmys terrapin*) from Florida, presented by Miss Hole; two Brush Turkeys (*Talegalla lathami*) from Australia, deposited; a Yak (*Poëphagus grunniens*, ♂); an English Wild Cow (*Bos taurus* var.), a Wapiti Deer (*Cervus canadensis*, ♀), born in the Gardens.

## OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL CONSTANTS.—Some account of the completed work of Drs. Gill and Elkin on the determination of astronomical constants by means of heliometrical measurement is given in the *Bulletin Astronomique* for August. The values there given differ by minute amounts from those contained in the preliminary paper published in the *Monthly Notices* for April 1894. For Solar Parallax the following values have been derived:—

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|---|---|---|---|---|
| | | ″ | | ″ |
| From observations of Victoria | ... | 8·8013 | ... | ±0·0061 |
| ,, ,, Sappho | ... | 8·7981 | ... | ±0·0114 |
| ,, ,, Iris | ... | 8·8120 | ... | ±0·0090 |
| Mean value ... ... | ... | 8·8036 | ... | ±0·0046 |

The value given by the Iris measures is slightly greater than that from the other asteroids, and the suggestion is made, but not insisted upon, that this might be explained by the light of Iris being somewhat less refrangible than that of the stars with which it has been compared, a fact that Dr. Elkin has noted in the course of his observations. Prof. Newcomb has pointed out that a not impossible difference between the spectrum of the planet and star could affect the resulting parallax to the extent of two or three hundredths of a second. Since, however, the mean value of the parallax does not differ from that derived from the observations of Iris by more than the probable error, no definite conclusion can be drawn on this point.

The value of the moon's mass, derived from the discussion of the observations of Victoria is

$$\frac{1}{81\cdot702 \pm 0\cdot094} = 0\cdot012240 \pm 0\cdot000015.$$

This result is believed to be free from the effects of any systematic errors.

The Constant of Nutation is given as 9·2068″±0·0034″, a value that lies midway between the generally accepted values of Newcomb and Chandler, viz. 9·210″ and 9·202″ respectively. This satisfactory agreement again points to the successful elimination of all systematic errors.

SMALL PLANET OBSERVATIONS.—The asteroid Abundantia, No. 151, has offered for solution a very curious problem. Since its discovery in 1875, it has been observed, or at least